

Rendezvous

VOLUME 4 ISSUE 2 SPRING 2010

Where today meets tomorrow

Program Proud

T&R Progress Report:

An overview of this spring's transition and retirement activities across NASA.

Space Generations:

What does the future of the space program look like?

Moving Forward:

Turning the spotlight on our human spaceflight partnerships.

Rely on Your Friendly EAP:

Where to turn when you're not sure what's next.

From Leadership

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Archives

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TRANSITION & Retirement

COMMENTS? QUESTIONS?

Please send us your feedback.

<http://rendezvous.jsc.nasa.gov>

PICTURED ABOVE: Endeavour is silhouetted against the Earth's horizon in this photograph captured by an Expedition 22 crew member on board the International Space Station during the STS-130 mission.

From Leadership

Among all the things we've done in the history of our shuttle program, the one activity that never fails to stir our emotions is the countdown to launch. For three decades, the country has counted down with us. And now, with only three launches remaining in the shuttle manifest, we seem to be counting down every minute left in the program.

And what a program it's been! What an incredible team it's taken to get us to this point in the history of the U.S. space program — thousands of people all dedicated to the same ideal and the same outcome. Just think of what we've accomplished — all the missions we completed, the station we helped build and the science we enabled.

In addition to maintaining our clear-eyed focus on every detail of safe flight and the success of the few missions we have left, it's also time to acknowledge the contributions of each and every member of our extended shuttle team, not just the crews, flight controllers, ground ops, orbiter processing, payload processing, launch and landing teams. Our program has a much larger family working behind the scenes — the resources, procurement and administrative staff who keep the business end of the shuttle program flying — a multi-generational, multi-disciplinary, multi-national family. And each member of the family is invested in the legacy of the program. We've celebrated our successes and mourned our losses together.

There are far too many unsung heroes of the shuttle program to honor here, but our common bond is the pride we share in our program. And even though our program is coming to an end, we still have work to do as a team.

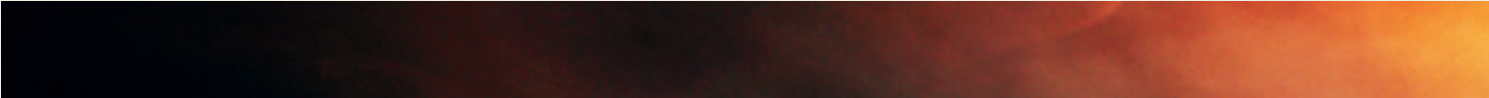
It's time now to think about the most important things to carry forward. There is a wealth of knowledge to be captured. There are critical skills to be maintained. There are processes to be preserved and lessons learned for future programs.

We have proven time and time again to be one of the most unique, creative, talented and qualified workforces on Earth. But there's still so much to learn, so much to explore. Let's make that journey together and look forward with anticipation to future challenges and achievements.

The proud program we retire this year is the foundation that we'll build upon for generations and years to come. That's our true legacy.



Dorothy Rasco
Manager, Space Shuttle Business Office
SSP T&R Lead
Johnson Space Center



From the Editor

Much has transpired since our last issue of Rendezvous (Winter 2010). Tweets were received from low Earth orbit. We flew two more successful missions and brought the space station to near completion. And the President defined his vision for the agency with the release of NASA's fiscal year 2011 budget.

In this issue's "T&R Progress Report," in addition to activities across the agency, we're also providing you with a recap of the 2011 budget and what it means for NASA. In the third installment of our Space Generations series, we talked to the youngest generation of our workforce — those who joined the program within the last decade — to find out how they look at the future and where they see themselves in it.

To address growing uncertainties and the questions rising among us as we draw nearer to our last mission, we visited with the employee assistance program offices at Johnson and Kennedy Space Centers to find out what resources are available to help us navigate through uncertain times ahead.

Finally, we looked into the activities of the Commercial Crew and Cargo Program Office, playfully known as C3PO, whose projects have moved from the technology drawing board to demonstration largely in Constellation's shadow. In the absence of shuttle-based transportation, the program's orbital transportation and cargo resupply services will be critically important to the continued operation of the space station.

Also, don't miss our Rendezvous interactive page. Our Web site can help provide you with all the transition-related information you need in the time between our quarterly publications. Please take advantage of opportunities to share your thoughts on transition. Answer our biweekly polling questions or share a memory in our digital scrapbook. Or just stop by to check out blogs by transition leaders and catch breaking news.

With all that's happened (and not happened) in the last couple of months and what it means for our future, it seems like a good time to remind ourselves just how incredible the Space Shuttle Program has been. What better way to celebrate its stunning achievements with the iconic image taken from the space station during the STS-130 mission emblazoned on our cover?

Underscored by Dorothy Rasco's message to remember what has made our program unique and what we need to carry forward, our theme for this issue is "Program Proud."

And so we are.

T&R

Progress Report Activities Across NASA



"I am 100 percent committed to the mission of NASA and its future. Because broadening our capabilities in space will continue to serve our society in ways that we can scarcely imagine. Because exploration will once more inspire wonder in a new generation – sparking passions and launching careers. And because, ultimately, if we fail to press forward in the pursuit of discovery, we are ceding our future and we are ceding that essential element of the American character."

— *President Barack Obama*
Kennedy Space Center
April 15, 2010

Bold New Challenge: FY 2011 Budget

New Team Charts Budget Course

Dibbs on that Shuttle Artifact

Recent Successes Bolster Commercial Spaceflight

ATK Conducts Final SSP Motor Test

Practice Makes Perfect

Stennis Announces New Testing Opportunity

Pictured above: Field support motor 17 (FSM-17) completes its successful test firing on Feb. 25 in Promontory, Utah.



Bold New Challenge: the NASA Fiscal Year 2011 Budget Summary

“As an Apollo astronaut, I know the importance of always pushing new frontiers as we explore space. The truth is that we have already been to the moon — some 40 years ago. A near-term focus on lowering the cost of access to space and on developing key, cutting-edge technologies to take us further, faster, is just what our nation needs to maintain its position as the leader in space exploration for the rest of this century.” – Buzz Aldrin

On Feb. 1, President Barack Obama released his proposed NASA fiscal year 2011 budget. The budget proposes to make major changes in human spaceflight programs and presents a new challenge to the entire agency. Its aim for the agency is to become an engine of innovation and to facilitate the growth of new commercial industries. The new budget directs NASA to focus and invest on research and development of new technologies with an increase in funding of \$6 billion over the next five years. This increase will open up new opportunities and allow for greater expansion in several key areas for NASA's research and development.

First, the budget will provide necessary funding to complete the remaining space shuttle flights by the end of this year. The \$600 million allocated to the shuttle program provides coverage for extending shuttle flights into the first quarter of 2011, should it become necessary. The final shuttle flight is currently scheduled for Sept. 16, and will deliver the Leonardo permanent multi-purpose module, and critical spare components to the International Space Station. After the end of the shuttle program, NASA will look to commercial space companies to deliver payloads to the station. NASA already has contracts in place with Space Exploration Technologies and Orbital Sciences Corp. to deliver cargo to the station.

After the end of the shuttle program, NASA will look to commercial space companies to deliver payloads to the station.

Second, \$183 million is slated to fund the extension of the space station until 2020 or beyond. This will allow NASA to use the laboratory as it was originally envisioned. New research facilities can also be deployed to conduct scientific research, such as a centrifuge to support research into human physiology, inflatable space habitats and a program to continuously upgrade station capabilities.

NASA's Constellation Program, will be canceled. After a thorough review by the United States Human Space Flight Plans Committee, it was determined that the program was very costly and behind schedule. In his proposal, Obama states that we are “launching a bold new effort that invests in American ingenuity for developing more capable and innovative technologies for future space exploration.”

Congress is currently reviewing the FY 2011 budget proposal. Until NASA receives authorization from Congress and the new bill is signed by the president, work on Constellation will proceed as previously directed by Congress.

The president's plan also aims to inspire today's youth to get more involved in the space program. NASA's Summer of Innovation, for example, will work with thousands of middle school teachers and students to engage students in stimulating, math- and science-based education programs.

NASA Main Budget Site: <http://www.nasa.gov/news/budget/index.html>

2011 Budget Overview: http://www.nasa.gov/pdf/420990main_FY_2011_Budget_Overview_1_Feb_2010.pdf

2011 Budget Fact Sheet: http://www.whitehouse.gov/omb/factsheet_department_nasa/

In a speech delivered on April 15 in the Operations & Checkout Building at Kennedy Space Center, President Obama further clarified his vision and strategy for the future of the U.S. space program. In addition to the initiatives outlined in the fiscal year 2011 budget for NASA, the president announced an initiative to “build upon the good work already done on the Orion crew capsule” by developing a rescue vehicle based on the Orion technology, and a \$3 billion investment in the research and development (no later than 2015) of an advanced heavy-lift rocket for the purpose of launching crew capsules, propulsion systems and heavy payloads needed to reach deep space.

The president explained that this new strategy for NASA would require revision of the old strategy (the Constellation Program) in order to not continue on the same path, but instead, “leap into the future.” The president addressed the fact that, with the modernization of Kennedy



President Barack Obama during his April 15 address at Kennedy Space Center.

Space Center and commercial competition to become part of a new space transportation industry, the new strategy would add approximately 2,500 jobs along the Space Coast in the next two years. He also proposed a \$40 million initiative led by a team from the White House, NASA and other agencies to develop a plan for regional economic growth and job creation to be submitted for his review by Aug. 15.

In closing, the president reiterated his belief in the role the space program has played in the country's past and its future.

"... for pennies on the dollar, the space program has fueled jobs and entire industries. For pennies on the dollar, the space program has improved our lives, advanced our society, strengthened our economy and inspired generations of Americans. And I have no doubt that NASA can continue to fulfill this role ... That is exactly why it's so essential that we pursue a new course and that we revitalize NASA and its mission – not just with dollars, but with clear aims and a larger purpose."

New Team Charts Budget Course

The president's FY 2011 budget proposal sets bold goals for space exploration at NASA, but some of the details have yet to be determined. The agency has responded by assembling a team to chart this new course for human spaceflight.

The Budget Rollout Integration Team, or BRIT, comprises 16 subteams assigned to specific program elements. The team, which includes representatives from Headquarters, NASA centers and cross-agency groups, meets weekly with top administrators and directorates to report progress and discuss the next steps.

Six of the subteams are focusing on how to implement brand new initiatives, and seven are examining the areas that would expand under the proposed budget. Two subteams are looking at how the new priorities could affect the transition from Constellation, as well as shuttle retirement. And a final team is working to ensure that the Space Shuttle Program has the capabilities needed to support shuttle flights if they slip into the first quarter of 2011.

BRIT Subteams
Technology Demonstration Program: Enabling Technology Development and Demonstration element
Technology Demonstration Program: Flagship Technology Demonstration element
Heavy-Lift and Propulsion Technology
Exploration Robotic Precursor Program
Commercial Spaceflight Theme
Human Research Program Enhancement
Participatory Exploration Program
Constellation Transition
Shuttle FY 2011 First Quarter Funding
Changes to Shuttle Transition Planning
ISS Augmentation Initiative
21st Century Launch Complex
Space Technology Initiative
Earth Science Augmentation
Aeronautics Augmentations
Education Programs

Dibbs on that Shuttle Artifact

It's not all that easy to find suitable homes for the hardware of the Space Shuttle Program. For example, there's a lot of interest in the shuttle trainers currently residing in Buildings 7 and 9 at Johnson Space Center. However, detailed discussions between NASA technical personnel and potential recipients are ongoing to make sure that the full implications of receiving such large items, including the costs of transportation and assembly, are fully understood. But for the moment, the following museums and institutions have been identified to house several key trainers.

- The Adler Planetarium, Chicago – Shuttle Fixed Base Simulator (Bldg. 7)
- The Museum of Flight, Seattle, Wash. – Full Fuselage Trainer (Bldg. 9)
- The National Museum of the U.S. Air Force, Dayton, Ohio – Crew Compartment Trainer-1 (Bldg. 9)
- The Smithsonian Institution National Air & Space Museum, Washington, D.C.– Crew Compartment Trainer-2 (Bldg. 9)
- Texas A&M Aerospace Engineering Department, College Station, Texas – Shuttle Motion Base Simulator (Bldg. 7)
- Virginia Air & Space Center, Hampton, Vir. – Shuttle Single System Crew Trainer (Bldg. 7)
- Wings of Dreams Aviation Museum, Starke, Fla. – Shuttle GNS Simulator (Bldg. 7)

Of course NASA reserves the right to retain any shuttle property, should a future use be identified for it.



A fish-eye view of the multifunction electronic display subsystem, or "glass cockpit" in the fixed base space shuttle mission simulator.

Recent Successes Bolster Commercial Spaceflight

Space Exploration Technologies (SpaceX) made headlines recently with two successful endeavors that could set the tone for a new era of space travel. SpaceX's Falcon 9 rocket and Dragon spacecraft have crossed crucial milestones, bringing the company one step closer to launching astronauts into low Earth orbit.

The Hawthorne, Calif.-based company successfully completed a static fire test of its Falcon 9 medium-lift rocket at Cape Canaveral, Fla., on March 13. Following a normal terminal countdown, the launch sequencer commanded ignition of all nine Merlin first stage engines for a duration lasting 3.5 seconds. With the success of the hot-fire test, the planning now focuses on additional launch preparations including tests of the Falcon 9 flight termination system. The test includes using explosives to destroy the rocket in the event that it goes off-course during the launch.



The Commercial Orbital Transportation Services (COTS) UHF communication unit system shown prior to its delivery to NASA.

SpaceX also successfully activated its ultra high frequency communication unit, which would allow communication between the Dragon spacecraft and the International Space Station. The new system will allow station crewmembers to monitor and command arriving or departing Dragon spacecraft during cargo delivery missions to the orbiting laboratory. Atlantis delivered the system hardware to the station on STS-129 in November.

On March 11, SpaceX and NASA's Johnson Space Center performed additional tests, using the new system to communicate between the space station and NASA's Dryden Flight Research Center at Edwards Airforce Base. The tests used live video and telemetry links from the station to verify the hardware's functionality, broadcast and reception signal strengths, and the system's stability over lengthy operations.

In 2008, NASA selected SpaceX's Falcon 9 and Dragon spacecraft to transport cargo to and from the station, starting in 2011. The Falcon 9 and Dragon are expected to deliver 20 tons of cargo to the space station over five years.

ATK Conducts Final Space Shuttle Solid Rocket Motor Test

Smoke curled into the sky as the test program for reusable solid rocket motors for the space shuttle came to an end on Feb. 25, in Promontory, Utah. The flight support motor, or FSM-17, burned for 123 seconds – the exact duration each reusable solid rocket motor burns during an actual shuttle launch.

ATK Launch Systems, a unit of Alliant Techsystems, has manufactured and tested the solid rocket motors for more than three decades. The first

test dates back to July 1977. The 52nd and final test was conducted to ensure the safe flight of the remaining shuttle missions.

During the two-minute static firing, a total of 43 design objectives were measured through 258 instrument channels. The flight motor tested is the same type that NASA will use for the remaining shuttle launches.

Practice Makes Perfect: Final External Tank Splicing Sets Record

External Tank-138, the flight tank designated to fuel the Space Shuttle Program's final flight, has completed a critical production milestone in record time. Lockheed Martin technicians and engineers at NASA's Michoud Assembly Facility in New Orleans mechanically attached the intertank and liquid oxygen tank to the liquid hydrogen tank after just 40 days of production, instead of the usual 60.

An external tank is composed of three parts: a 54.6-foot tall bullet-shaped liquid oxygen tank at the top, a 96.7-foot tall liquid hydrogen tank at the bottom and a 22.5-foot long intertank that separates the two.

ET-138 will now proceed to the final assembly area for more processing. It is scheduled for completion June 29, to support the Sept. 16 launch of Discovery on STS-133.

Stennis Announces New Rocket Engine Testing Opportunity

NASA's Stennis Space Center will test the Aerojet AJ26 rocket engines for Orbital Sciences Corporation. The announcement reflects NASA's new directive to work closer with commercial interests on space exploration development. The AJ26 is the first new engine in years that will be tested at Stennis,

and represents the commercial work that the facility is now pursuing. It will power Orbital's Taurus II space launch vehicle for supply missions to the International Space Station. Stennis also provides rocket engine testing for Pratt & Whitney Rocketdyne.

Operators at Stennis began modifying the E-1 Test Stand last April in order to test the AJ26 engines.

Orbital develops and manufactures small and medium class rockets and space systems for commercial, military and civil government customers. Orbital is now working in partnership with NASA under the agency's Commercial Orbital Transportation Services joint research and development program, and is under contract with NASA through the Commercial Resupply Services program to provide eight cargo missions to the station by 2015.



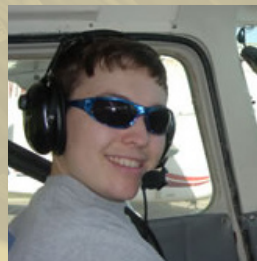
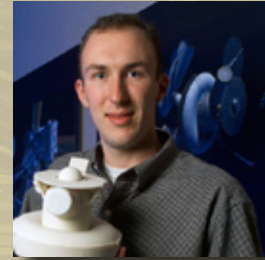
A crane in Michoud Assembly Facility begins the laydown of ET-138 after splicing.



Testing on the Aerojet AJ26 rocket engines is scheduled to begin this summer at Stennis' E-1 test stand.

Space Generations

Future Leaders



What does the future of the space program look like?

For an entire generation, human spaceflight has always been a reality. In their lifetime, they have never known a time without humans in space.

When the Space Shuttle Program was in its infancy, the youngest members of its workforce were just infants themselves. As the program developed and experienced the growing pains that come with maturation, it did so along with this generation.

When Sally Ride became the first female astronaut, this generation was experiencing their own firsts: first words, first steps and first days of school. When Atlantis launched Galileo, this generation watched in science class. When Endeavour took the crew up to assemble the first pieces of the International Space Station, this generation was looking forward to a holiday break between semesters. And when Discovery took off for Return to Flight, the careers of this generation were just taking off as well. These “kids” grew up together.

But now, as the shuttle program prepares to retire, what will happen with the young generation it inspired? How will this generation leave its mark on the space program? And what will they do when the only program they have ever known comes to completion? To answer these questions, Rendezvous sat down with a few representatives of this younger segment of the space program's workforce. And in doing so, found that wisdom doesn't just come from age.

Generation Y

This is a generation that, for the most part, does not know a world without the Internet. Rotary phones are as ancient to them as the Model T and black and white television. As a matter of fact, a lot of them don't have landline telephones at all.

Technology and innovation are an integral part of who this generation is. It's a part of their culture. It only makes sense that careers in human spaceflight would be right up their alley. But just being adept with technology and innovation isn't what brings them here. After all, those skills can be applied in a variety of fields today. Fundamentally, there is an inspiration that brings individuals to human spaceflight. For older generations, it was seeing early launches and the moon landings. So what is it that inspires this generation?



Like those before them, the younger generation developed their desire for space and exploration early on. John Givens, an electrical engineer with Kennedy Space Center Ground Operations is no exception. Givens, who started as a co-op at Kennedy Space Center, spent time employed by United Space Alliance before starting his current job with NASA in 2005.

“Exploration and space have always intrigued and inspired me,” Givens said. “A love for science at a young age was a big motivator as well.”

Of course, his original aspiration was to be an astronaut, but after experiencing some stall tests in a private aircraft with his father, his plans changed. The test involved stalling the engine of the plane in midflight, and then recovering power within 1,000 feet. The tests were not only successful in developing his father's skills, but also in helping Givens develop a healthy fear of heights and greater appreciation for ground ops.

Connor Jones, who also started his career in 2005, realized his desire to be a part of the program during an internship with his current employer, Alliant Techsystems (ATK). It was during this time that he experienced two awe-inspiring moments that would bring him back to ATK for more. The first was “the sheer power” of his first static motor test. The second was just as powerful, but on a different level.

“I really knew this is what I wanted to do after being a part of Return to Flight,” Jones said. “Just seeing all the emotion and excitement from all of the people who have poured so much of their selves into something, that was really inspiring.”

After getting his mechanical engineering degree from Utah State University, Jones was hired by Alliant Techsystems as an integration design engineer.

Jones and Givens, along with the rest of their young peers in the shuttle program, are now working on the other side of what inspired them.

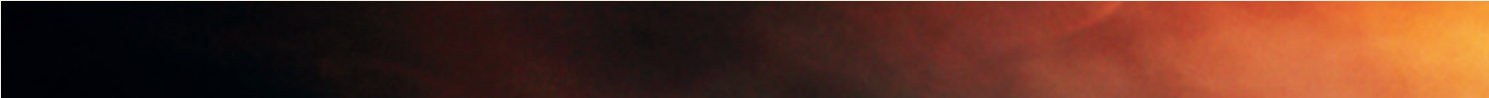


An example of a static motor test of a space shuttle Reusable Solid Rocket Motor, conducted by Marshall Space Flight Center at the Alliant Techsystems facility in Promontory, Utah.

Enthusiasm and energy

Each of the three generations that make up the Space Shuttle Program brings something unique to human spaceflight. The seasoned veterans bring decades of experience, not only from the shuttle program, but from all the programs. NASA was built on their broad shoulders. They've been here through it all. The middle generation offers a steadfast dedication. Many of them have worked solely on the shuttle program from the beginning of their careers. They know it well. They've spent three decades making it the success it is.

So, if not years, what does this younger generation have to offer the space program?



Tammie Wright, manager of Johnson Space Center's Cooperative Education Program, sees firsthand what this generation has to offer. Since 2008, Wright has been working to recruit and place students within the center's organizations.

"They're definitely enthusiastic and bright," Wright said. "They're always trying to improve things and they have a lot of energy, which makes them hard to keep up with."

"I think we bring some fresh ideas," Givens said. "Being a government establishment, we tend to get stuck in our ways and don't want to change that often."

Givens remembers being a part of the upgrades to ground control systems at Kennedy Space Center, and being surprised at the resistance to change in the beginning of the process. He found that odd as it just seemed like some needed improvements to him. That resistance faded with time and as everyone saw the benefits of the updated systems.

"Adapting to change just seems easier when you're young," Givens said.

Wright acknowledges that a good deal of what this generation has to offer comes as a function of being young, and she believes that previous generations brought many of those same characteristics in their day. But she also acknowledges that youth, coupled with the time we live in now, help make this generation unique.

"Clearly, other generations were enthusiastic and innovative or we wouldn't be where we are today," Wright said. "But, this generation has the benefit of improved technologies and new ways of collaboration, which can make innovation easier."

The program needs those who can best adapt, be it to new technologies or just stepping up to take third shift. Often, it is the younger generation who is best at this.

"It's fun to work with them and fun to see the enthusiasm they bring," Wright said. "I think organizations benefit by having young people around to enhance the talent pool."

In addition to fresh ideas and fresh legs, the younger generation brings a fresh optimism. Because of the leaps and strides taken by previous generations, they look at the future as a landscape where absolutely anything is possible.

What this younger generation lacks in experience they make up for in many other ways.

**If adapting to change is what this generation
is good at, they couldn't have picked a
better time to join the world of human spaceflight.**

Making the transition

If adapting to change is what this generation is good at, they couldn't have picked a better time to join the world of human spaceflight. Even with the optimism of youth, there is no ignoring that this is a trying time for many.

"When you're talking about transition, you know you're going to have some dark moments," Givens said.

Jones recalls hearing about transition when he started in 2005, though it seemed a long way off back then. Today, however, between the Review of Human Spaceflight Plans Committee and the proposed 2011 budget, transition certainly feels very right now.

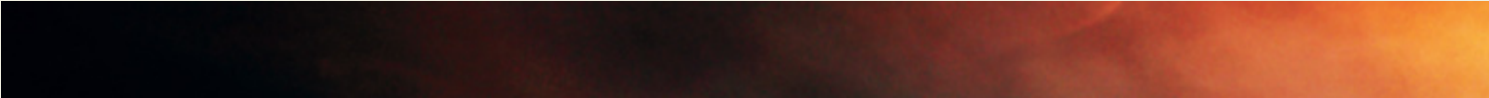
"There's a lot of talk around the watercoolers and cubicles," Jones said. "But we're staying focused and getting our jobs done."

They're more than two thousand miles apart, but Givens still hears some of the same watercooler talk.

"It's a distraction, that's for sure," Givens said. "Everyone still wants to give their last efforts to see everything ride out safely, though."

**There is a defined job in front of
them, and nothing is going to keep them
from completing that job ...**

Even in the midst of distraction and transition activities, this generation seems to be right in line with the rest of the workforce. There is a defined job in front of them, and nothing is going to keep them from completing that job to the absolute best of their abilities.



“As far as working double duty, there’s been some of it, but I have been directed to work shuttle, complete it,” Givens said. “By that time, the future work should be defined, and I’ll transition over and work on the new thing.”

What that new thing will be is still undefined, but Givens and his generation are remaining excited about the possibilities, even in the face of the uncertainty.

“There are a lot of emotions when it comes to transition,” Givens said. “There is sadness when considering what shuttle retirement means for some of my counterparts. At the same time, in the midst of transitioning two programs, there is a lot of excitement about developing new things. We’ll get to do it however we want.”

Preparing for the future

This generation’s optimism is certainly not naïve. They learned early on that things can change at any minute. With the maturity and foresight they’ve already demonstrated, they can handle transition. As Wright notes, one of the qualities that makes this generation unique is a predisposition for change.

“When my parents were working, you could work for the same employer your whole life,” Wright said. “This generation understands that is probably not going to happen, and they may not want that to happen. They’re into trying new things and having new experiences.”

**Part of being able to handle change
is hoping for the best but preparing
for whatever may come.**

Part of being able to handle change is hoping for the best but preparing for whatever may come.

“I have a sliver of confidence, but that’s not going to stop me from having my own ‘Plan B,’” Givens said. “All I can do is my best. If they decide to expend me, they do. If they don’t, then they don’t. We’ll see. I’m still young. It might be a little bit of a tough time, but we’ll get through it.”

As this transition continues and the Space Shuttle Program draws nearer to retirement, the youngest generation appears to be exactly where they need to be. They are focusing on the task at hand, adapting to the changes happening all around them, and remaining optimistic about the future.

“I’m confident,” Jones said. “As a nation, we’re going to do what is best for the future of human spaceflight.”

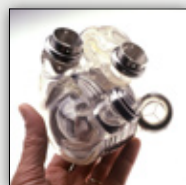
Generation Timeline: The 2000's

As *Rendezvous* takes a look at the generations that comprise the shuttle workforce over a series of issues, we'll also look back at some of the events, shuttle-related and otherwise, that marked the path to where we are today.



February 12, 2001 – The NEAR Shoemaker spacecraft becomes the first spacecraft to land on an asteroid.

March 23, 2001 – The Russian space station MIR is deliberately de-orbited and breaks apart during atmospheric re-entry.



July 2, 2001 – The world's first self-contained artificial heart named AbioCor is implanted in Robert L. Tools.



October 23, 2001 – The iPod, Apple's portable media player, launches as a Mac-compatible product with a 5 GB hard drive that puts "1,000 songs in your pocket."

September 11, 2001 – Al-Qaeda terrorists attack the World Trade Center in New York City, and the Pentagon in Washington, D.C.



December 2, 2001 – Enron files for Chapter 11 bankruptcy, largest in history at the time.

December 27, 2001 – The People's Republic of China is granted permanent normal trade status with the U.S.



May 26, 2002 – The Mars Odyssey space probe finds signs of huge water ice deposits on the planet Mars.



February 1, 2003 – Space Shuttle Columbia (STS-107) breaks apart during re-entry.

March 19, 2003 – Operation Iraqi Freedom is launched with the invasion of Iraq by a multinational force led by troops from the United States and the United Kingdom.

September 6, 2003 – California Governor Gray Davis is ousted in a recall vote; actor/bodybuilder Arnold Schwarzenegger is elected in his place.



February 4, 2004 – The social networking Web site Facebook launches as a way of helping college students get to know each other better.



June 21, 2004 – SpaceShipOne becomes the first privately funded space plane to achieve spaceflight.

December 26, 2004 – The Sumatra-Andaman earthquake in the Indian Ocean resulted in a series of tsunamis that devastated southeast Asia. It was one of the deadliest natural disasters in recorded history.

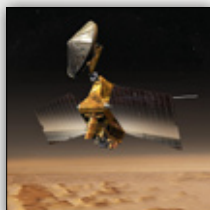
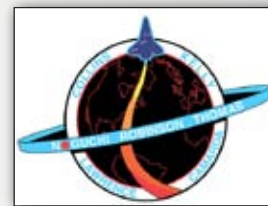
April 2, 2005 – Pope John Paul II dies. Seventeen days later Pope Benedict XVI is installed as head of the Catholic Church.



July 24, 2005 – Lance Armstrong wins record 7th consecutive Tour de France.



July 26, 2005 – The space shuttle fleet returns to flight with STS-114 after a two-and-a-half-year stand down.



August 12, 2005 – The Mars Reconnaissance Orbiter, designed to conduct reconnaissance and exploration of Mars from orbit, launches.

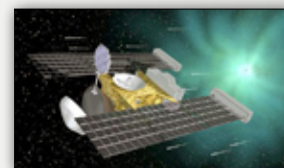
August 29, 2005 – Hurricane Katrina, the costliest hurricane (\$81.2 billion) and one of the five deadliest in U.S. history, makes landfall as a Category 3 storm in southeast Louisiana.



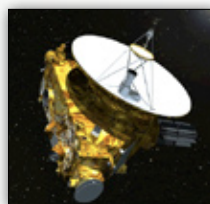
February 14, 2005 – YouTube, a video sharing Web site, launches and soon becomes a worldwide phenomenon.



January 15, 2006 – The Stardust mission is successfully concluded with the return of the first comet samples.



January 19, 2006 – The New Horizons spacecraft is launched, beginning the first ever mission to Pluto.



August 17, 2008 – Michael Phelps wins an 8th gold medal in Beijing and sets record for most during one Olympic games.

October 3, 2008 – President George W. Bush signs the Emergency Economic Stabilization Act of 2008, creating a \$700 billion Troubled Assets Relief Program to purchase failing bank assets.



January 15, 2009 – Captain "Sully" Sullenberger lands US Airways Flight 1549 on the Hudson River. All 155 aboard survive.

January 20, 2009 – Barack Obama is inaugurated becoming the 44th overall and the first African-American U.S. President.



May 11, 2009 – STS-125 launches bound for Hubble. The mission is the fifth and final space shuttle servicing mission to the Hubble Space Telescope.



June 25, 2009 – Michael Jackson, 'The King of Pop,' dies.

August 6, 2009 – Sonia Sotomayor is confirmed by the United States Senate, making her the Supreme Court's 111th justice, its third female justice, and first Hispanic justice in U.S. history.



A Gateway: NASA's Cooperative Education Program

Everybody has a childhood dream. For some, it is to be a doctor, a professional athlete or a movie star. But there are others who set their sights a little higher.

With a generation that has grown up in an era of human spaceflight, and the age of technology, many youthful minds have taken their educational paths toward aeronautics or technologies associated with spaceflight. NASA's Cooperative Education Program is a gateway for those students to make those childhood dreams a reality. Every NASA center recruits Cooperative Education students to the program, which is designed to give students invaluable training and experience with the possibility of full-time employment after graduation. The program gives full-time students the opportunity to combine academic studies with on-the-job training, and an out of this world experience.

The co-op program has been a source for potential NASA employees for nearly 50 years, continuing the agency's commitment to technology advancement and excellence. Business and technical co-op students typically alternate semesters of working full time at the agency with semesters of academic study at their respective schools.

For more information on the NASA's Cooperative Education Program, visit:

http://www.nasajobs.nasa.gov/studentopps/employment/coop_edu_program.htm




Moving Forward

Turning the spotlight on our human space flight partnerships.

The President's proposed 2011 budget for NASA delineated a new plan and a new path for the U.S. space program, one that called for the agency to become "an engine of innovation" by pursuing a more sustainable and affordable approach to human space exploration. Under the new plan, continuous American access to the International Space Station would be assured. This objective is not entirely new. In fact, the Commercial Crew and Cargo Program Office, known as C3PO, was formed back in 2005 specifically to develop spaceflight capabilities in partnership with private industry for that purpose.

Pictured above: Installing the Falcon 9 second stage into the newest test stand at SpaceX's Texas test site.



Rendezvous turned to Valin Thorn, Deputy Program Manager of C3PO, to learn about the program's two primary projects known as Commercial Orbital Transportation System, or COTS, and Commercial Crew Development, or CCDev. In this issue, we look at the development and work-in-progress of COTS. In our next issue, we'll look in greater detail at the participants and progress of the CCDev project.

Five years ago, the need for a U.S.-based mode of crew and cargo transportation to the International Space Station was quite clear. With the space shuttle fleet retiring, the only transportation for either — until a new U.S. vehicle was developed — belonged to our space station partners to provide them. The European Automated Transfer Vehicle (ATV) and the Japanese HII Transfer Vehicle (HTV) would eventually be capable of delivering cargo. However, aside from the space shuttle, only the Russians' Soyuz could deliver crew and return them to Earth.

Not long after the nation's Vision for Space Exploration was announced in January 2004, concerns were raised regarding the coming shortfall in station logistics needs. Filling this need for routine transportation service to and from the station was viewed as a significant opportunity for commercial space enterprise. Not only could a more robust commercial space venture help the agency meet exploration objectives while creating new jobs and new industry, but it held the potential of providing space technology and services in a more cost-effective manner.

Cost is the challenge

The cost of space transportation is, and always has been, a challenge to space exploration and utilization. But, by encouraging commercial space enterprise, the agency can write a new future beyond low Earth orbit, one in which NASA can develop technologies, explore and push the boundaries of space while the private sector handles routine spaceflight, improves efficiencies and lowers costs.

**... by encouraging commercial space
enterprise, the agency can write a new
future beyond low Earth orbit ...**

These were the driving forces behind the formation of the Commercial Crew and Cargo Program Office, its Commercial Orbital Transportation Systems project, and its Crew and Cargo Development project. The program's objectives were unlike any in the history of NASA. In fact, fundamental to the program's success was the alien idea that the agency play the role of assisting partner rather than the other way around. The commercial partners would develop, own and operate the new systems, and the agency would contribute additional investment to the partners as they met key milestones set forth in Space Act Agreements.

"We expect these commercial services, for cargo and crew, to be much lower and free up substantial NASA resources to focus on our main mission, which should be exploring space."

But how and where does COTS fit into NASA's big picture? Thorn sees it as a program that will enable NASA's exploration mission, as complementary, allowing NASA to focus on that key mission. Commercial services to support the station also significantly lower its cost of operations, improving its financial viability.

Assembling the team

An investment of \$500 million was budgeted for COTS to cover fiscal years 2006 through 2010. The agency determined that the project would be executed in two phases. Phase 1 would consist of technical development and demonstrations funded by Space Act Agreements in which the private sector would lead the effort. NASA's role would be to provide financial assistance, as well as oversight by a commercial advisory team (CAT) established to provide expert assistance and technical review of the industry partners' development activities. Cargo space transportation demonstrations were planned for 2009 and 2010 initially, with NASA funding kicking in only upon completion of specific system development milestones. Phase 2 would be the competitive procurement of space station cargo resupply services.

**"The whole strategic plan for COTS was that,
ultimately, we would launch crews to the
station, but we would start with cargo services."**

"The whole strategic plan for COTS was that, ultimately, we would be launching crews to the station, but we would start with cargo services," Thorn explained. "We'd prove cargo capabilities and reliability first, and then move into crew transportation."

By August 2006, the Phase 1 COTS competition was completed resulting in the selection of two commercial partners — Space Exploration Technologies (SpaceX) and Rocketplane-Kistler. After failing to meet certain technical and financial milestones, the Space Act Agreement with Rocketplane-Kistler was terminated. Orbital Sciences Corporation was then selected as the second COTS commercial partner in February 2008. And in December 2008, SpaceX and Orbital were awarded the Cargo Resupply Services (CRS) contracts for station cargo services.

COTS demonstration flights

Since their Phase 1 selection in 2006, SpaceX has nearly completed development of their Falcon 9 medium class booster and Dragon cargo spacecraft with 16 of 22 formal development milestones accomplished. The Falcon 9 booster is now on Kennedy Space Center's Pad 40 in preparation for its maiden flight in May. It will carry the Dragon spacecraft structural test article. The second launch of the Falcon 9 later this summer is for the first official COTS demonstration mission. This first demonstration mission will last less than a day and will confirm launch vehicle performance and basic Dragon spacecraft functionality. Demo Flight 2, tentatively scheduled for November 2010, will test the spacecraft's rendezvous capabilities in a fly-by of the space station. Demo Flight 3, tentatively planned for February 2011, will be a demonstration of cargo delivery to the station. The three demo flights will complete SpaceX's COTS cargo transportation development effort.



SpaceX's full flight-ready Falcon 9 with Dragon Spacecraft Qualification Unit sits on the Kennedy's Pad 40 ready to launch in May.



An artist's rendering of Orbital's Taurus II at Wallops Flight Facility.

Orbital has been busy readying their COTS system for demonstration, as well. Their system consists of the

Taurus II launch vehicle and the Cygnus Service Module. Orbital is currently developing their system in their facilities in Dulles, Va., and Chandler, Ariz., with their flight demos scheduled for 2011 using Goddard Space Flight Center's Wallops Flight Facility as the launch site. Orbital Sciences has passed Critical Design Reviews for its Taurus II rocket and Cygnus cargo spacecraft — completing 14 of 21 formal development milestones. Their first stage liquid oxygen/rocket propellant-1 (LOX/RP1) fueled engines begin testing at Stennis Space Center this summer.

Phase 2 of the COTS program, the operational services phase, is covered by the Cargo Resupply Services contract for the International Space Station. Awarded in December 2008 to SpaceX and Orbital, cargo missions are currently scheduled to begin in 2011 and run through 2015. SpaceX was awarded 12 missions at a contract value of \$1.6 billion. Orbital was awarded eight missions, a contract worth approximately \$1.9 billion. As yet, no draft request for proposal has been released by NASA's procurement office to secure the cargo resupply services required to extend the life of the space station, as proposed in the president's 2011 budget for NASA.

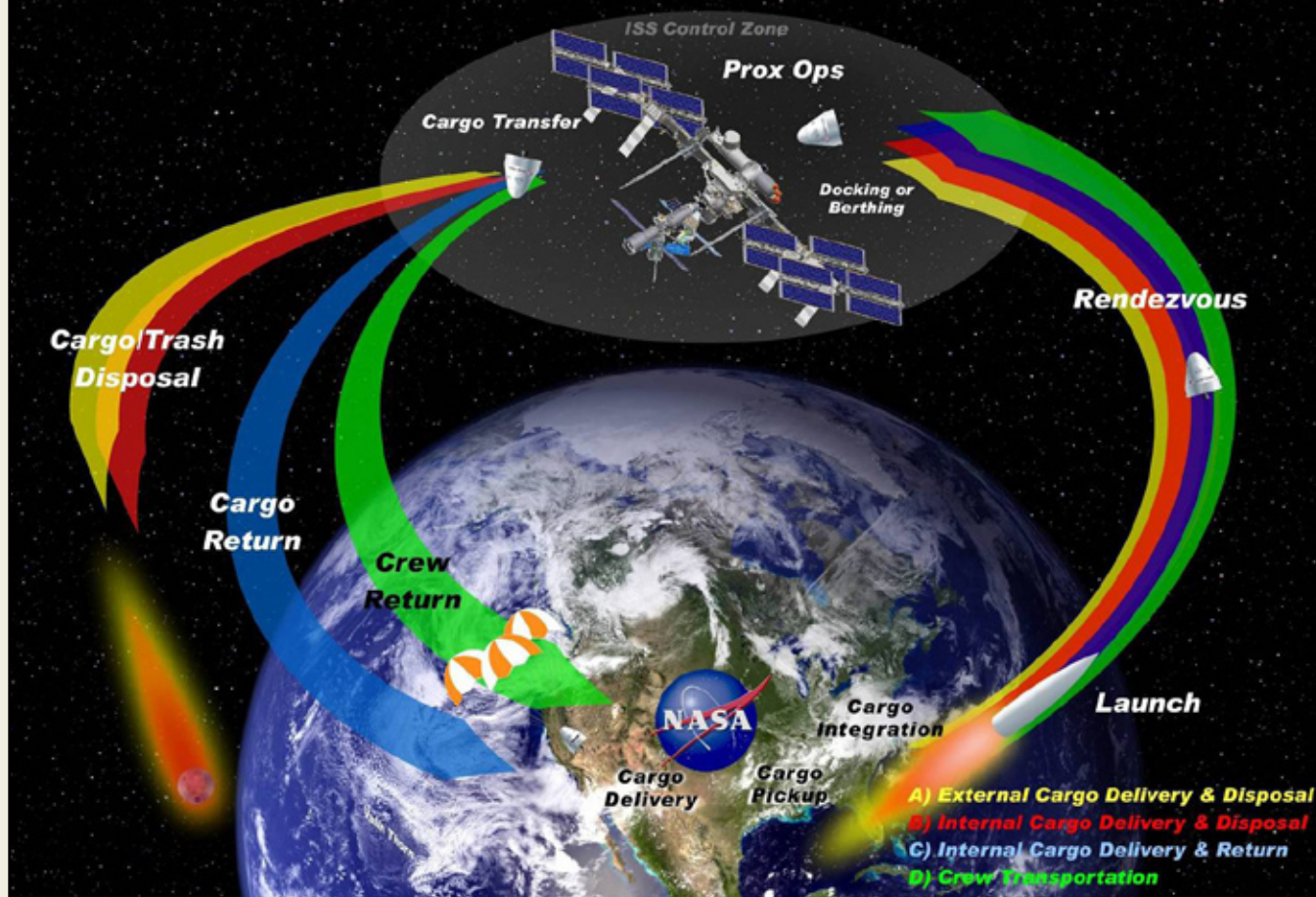
A complementary, enabling program

Thorn sees the president's proposed new NASA policy and budget as reshaping NASA for a more effective exploration program. On the commercial spaceflight side, the president has proposed \$5.8 billion over the next five years to invest in the development of commercially provided crew space transportation systems. With the shuttle's pending retirement and associated significant reduction in work, Kennedy Space Center has been designated as the NASA center to lead this new program with Johnson Space Center in support.

"This is a vital and complementary program where lowering space transportation costs will open up new markets that will ultimately benefit everyone," Thorn said. "There's still a long way to go in bringing costs down, but these are critical steps in the right direction."

The coming demonstration flights, first for the SpaceX system and later for Orbital's, are important milestones, as well as critical validation of the COTS private/public partnership model for commercial space transportation system developments.

NASA Commercial Crew & Cargo Program Commercial Orbital Transportation Services



COTS Timeline



* COTS crew transportation capability is a Phase 1 option and is currently not funded or authorized

Commercial Crew & Cargo Program Objectives

C3PO was established at the Johnson Space Center in November 2005 to accomplish the following:

- Implement U.S. space exploration policy with investments to stimulate the commercial space industry.
- Facilitate U.S. private industry demonstration of cargo and crew space transportation capabilities with the goal of achieving safe, reliable, cost-effective access to low Earth orbit.
- Create a market environment where commercial space transportation services are available to government and private sector customers.

What's in a Space Act Agreement?

A Space Act Agreement (SAA) is a legal authority for establishing agreements granted to NASA when it was created. They are often used when entering in partnerships with external non-government organizations and often do not include any financial payments. The COTS SAAs are unique in that they are funded SAAs where NASA makes incremental fixed price financial investments in private companies as they achieve negotiated performance milestones. They also allow companies to retain maximum rights to developed intellectual and personal property as allowed by law. There are also provisions in the SAAs that cover Federal Aviation Administration licensing and cross-waiver liabilities. NASA's agreements with industry partners on both the COTS and CCDev projects are funded SAAs. There are also unfunded SAAs in which industry teams develop pertinent space transportation capabilities with some limited technical assistance, but without financial assistance. NASA also uses SAAs to establish agreements with companies that "hire" NASA to do work or to use NASA facilities. These are known as reimbursable SAAs.

The Falcon and the Dragon

SpaceX's medium class launch vehicle is the Falcon 9. According to the company's Web site, it was designed to provide breakthrough advances in reliability, cost, flight environment and time-to-launch. The rocket is a two-stage, liquid oxygen and rocket-grade kerosene powered launch vehicle. It uses the same engines (Merlin and Kestrel), structural architecture (with a wider diameter), avionics and launch system as the Falcon 1 and Falcon 1e.

Falcon 9 highlights

- Length: 180 feet
- Width: 11.8 feet
- Mass (LEO): 734,146 pounds
- Mass (GTO): 732,825 pounds
- Thrust (vacuum): 4.94 meganewton

The Dragon is a free-flying, reusable spacecraft capsule designed for transport of pressurized cargo, unpressurized cargo and, eventually, crewmembers. It comprises three main elements. The nosecone protects the vessel and the docking adaptor during ascent. The spacecraft houses pressurized cargo and/or crew, and the service section (avionics, reaction control system, parachutes and other support infrastructure). The trunk provides for stowage of unpressurized cargo and supports the Dragon's solar arrays and thermal radiators.

Dragon highlights

- Payload upmass: 13,212 pounds
- Payload downmass: 6,606 pounds
- Payload volume: 245 cubic feet pressurized, 490 cubic feet unpressurized
- Crew configuration: seven passengers
- Avionics system: two-fault tolerance with extensive heritage
- Reaction control system: 18 monomethylhydrazine/nitrogen tetroxide oxidiser thrusters
- Propellant: 2,840 pounds supports safe mission profile (sub-orbital insertion-ISS rendezvous-re-entry)
- Integral common berthing system: Low impact docking system or androgynous peripheral assembly system support

The Taurus and the Cygnus (the Bull and the Swan)

The Taurus II is a new launch vehicle designed by Orbital to provide reliable, low-cost access to space for medium class payloads. It will be used for the COTS CRS launches as well as future science and exploration missions, commercial and national security missions. The launch system was developed using the same management approaches, engineering standards and production and test processes designed for Orbital's Pegasus®, Taurus® and Minotaur launch systems. Taurus II Stage 1 is powered by a pair of Aerojet AJ26-62 engines (with independent thrust vectoring). The ATK Castor™ 30 solid motor (with thrust vectoring) powers the launch system's second stage.

Taurus II highlights

- Length: 132.8 feet
- Width: 12.8 feet
- Mass: 638,580 pounds
- Payload (LEO): 10,459 pounds to 13,762 pounds

The Cygnus Service Module, also known as the Cygnus Advanced Maneuvering Spacecraft comprises a common service module and a pressurized cargo module. The service module houses the avionics systems, and the propulsion and power systems. The pressurized service module is based on the multi-purpose logistics module currently used for the International Space Station, and will carry crew supplies, spares and scientific experiments. The Cygnus spacecraft features significant maneuvering capability as it transports cargo from a low orbit to the space station.

Cygnus service module highlights

- Heritage: STAR Bus, LEO Star
- Power generation: two fixed-wing solar arrays, ZTJ Gallium Arsenide cells
- Power output: 3.5 kilowatt (sun-pointed)
- Propellant: Dual-mode hydrazine (N₂H₄)/mixed oxides of nitrogen-3 (MON-3) or N₂H₄

Cygnus pressurized cargo module highlights

- Heritage: multi-purpose logistics module
- Total payload mass: 4,404 pounds (standard), 5,945 pounds (enhanced)
- Pressurized volume: 660 cubic feet
- Berthing at ISS: Harmony Node common berthing mechanism (CBM)



RELY ON **Your Friendly** **EAP:**

Where to turn when you're not sure what is next.

**What does the
budget spell for
our futures?**

One would think that with the close of the shuttle program less than a year away and the possible shelving of the Constellation Program now pending, the employee assistance programs (EAP) at centers across the agency would be flooded with requests for assistance. It appears, however, that the space program workforce has yet to digest the full meaning of the budget and what it spells for the future. Or they've digested it, Or they've digested it, but aren't sure how to move forward.

According to both Patti Bell and Jackie Reese, EAP counselors at Kennedy Space Center in Florida and Johnson Space Center in Houston, respectively, their centers are currently seeing a slow but steady increase in stress levels. They're not exactly being deluged by requests for assistance, but they're ready for it.

EAP counselors and their human resource counterparts at the centers and contractor locations are trained, first and foremost, to help employees with the kind of unresolved personal problems that can interfere with work performance — things like work-related stress, health issues, financial concerns, legal problems, substance abuse and emotional difficulties. However, when the shock of what the new budget proposal really means wears off, the EAP offices will be ready to provide whatever assistance is needed, including transition counseling, coaching for stress management, resiliency workshops and referrals to external resources to help with résumé preparation and job searches.

The tools Bell, Reese and their groups are using to meet those needs are tried, true and familiar to many. Lunch 'n Learns. Workshops. Training classes. One-on-one counseling. In fact, NASA's employee assistance programs at all the centers have been actively preparing for several years now, developing strategies and tactics to address the shuttle program's retirement and the associated uncertainties its workforce will experience.

Action and proaction

Bell's group at Kennedy has a curriculum of specific modules for managers and supervisors such as "Managing Workplace Stress" and "Meeting the Needs of a Workforce in Transition," and they deliver talks such as "Setting Realistic Goals," "Effective Communications Strategies" and "Adapting Well in the Face of Adversity," the latter of which is a primer on how to build resiliency. In other words, a how-to guide on bouncing back from difficult times. In addition, they present a monthly luncheon lecture series that delves into a variety of stress-inducing issues.

In short, Bell and her colleague seek to provide the workforce with the tools needed to cope first and then move forward into the rest of their lives. Though the coping can be difficult, it's the moving forward part that can be downright scary. Bell noted that in the past year, she and her fellow counselor have noticed an increase in stress levels at Kennedy stemming from facing the unknown.



Patti Bell, EAP counselor at Kennedy Space Center.

**Though the coping can be difficult,
it's the moving forward part that
can be downright scary.**

"Although employees know that the shuttle is going away, they're not sure if or how they'll be directly affected," she said.



Jackie Reese, EAP counselor at the Johnson Space Center.

At Johnson Space Center, Reese has seen her workforce fall into two groups at varying stages of dealing with transition. The first group grew up with the shuttle program, so they're attached to the vehicle itself or its hardware or software.

"Those folks have an understandable sadness about the shuttle's retirement, and some questioned whether the shuttle should be retired at all," she recounted.

This group was involved in the shuttle upgrade program and wanted to see that continue, but most were also willing to move on once they saw their shuttles safely berthed for good.

The other group felt, and continues to feel, that shuttle retirement is the right step. They look forward to what's next. These were the folks most likely to move over to Constellation early on in order to develop a good foundation for the continuation of both their careers and the space program.

To one degree or another, however, both groups became technically and emotionally invested in Constellation. They were, in their own way, already dealing with the transition from shuttle to Constellation, but Reese believes that was really more about closing out a program, reflecting on its significant history and moving into the next phase of spaceflight and exploration.

"We have folks working shuttle now who weren't quite sure what their role in Constellation would be, but

felt certain that they would be a part of it,” Reese elaborated. “Now that looks like it’s gone.”

Overall, Reese’s workforce at Johnson is reacting in much the same way as Bell’s at Kennedy. Initially, after the budget announcement, people were stunned. And then they did what they always do after a crisis: go into mission mode, which is strictly a present-tense focus and exactly what is needed to fly the remaining shuttle missions safely and successfully.



As the timeline winds down on the shuttle, President Barack Obama, along with NASA Administrator Charles Bolden and top advisors have been working to define NASA’s future direction. Here, Obama addresses a gathering of NASA officials, members of the space program workforce, and the press at the Operations & Checkout Building at Kennedy Space Center on April 15.

Assessing all the risk factors

Even though it’s common knowledge that jobs will be shut down with the program, many people aren’t sure how they’ll be affected, personally, or when. They feel as if they don’t have all the details, the whole story – the information they need to make informed decisions. To put it in NASA terms, the data needed to assess their risk factors.

That’s what those who work in human spaceflight do — assess the risk to safe flight, then make the go/no-go decision. But when only part of the information is available, that assessment is incomplete.

In this particular instance, shuttle workers are being asked to assess the risk to safe life — fulfilling, long-term careers and the well being of their families. And not having all the details, not being able to weigh all the alternatives because many of them have yet to come into sharp focus, creates anxiety.

**... not being able to weigh all the alternatives
because many of them have yet to come
into sharp focus, creates anxiety.**

To prepare strategies to address workforce anxiety and the anticipated groundswell of EAP inquiries, Bell and her colleague, Walt Hersing, meet regularly with all the human resource directors as well as the Workforce Stress Indicators Committee – a council of human resources, protective services, safety, occupational health and EAP representatives assembled several years ago to keep their finger on the pulse of the workforce and monitor stress trends with shuttle transition in mind. They have also met with a number of local organizations such as the Aerospace Workforce Transition Program and the Brevard Workforce Development Board (BWDB) to develop solutions to better equip the workforce for the trying times ahead, such as workshops on career planning, résumé writing, financial planning and managing change. [Ed. Note: See Outside the Gates, Rendezvous Volume 3, Issue 3, Fall 2009.]

“We partner with all the key players to facilitate stress workshops, Lunch ‘n Learns and other educational meetings on coping with change and learning resilience,” Bell explained. “There’s a BWDB van that visits outlying areas to offer all their services, and they man a regular office at Kennedy. NASA human resources has an additional office right next door.”

At Johnson Space Center, Reese's approach is similar.

"We have a lot of managers and supervisors calling us and asking us to bring in workshops on transition stress and resiliency," Reese said. "Because some of the folks, the ones who have the double whammy of both shuttle close-out and Constellation cancellation, will be impacted sooner than later, they're more in the mode of trying to figure out what's next."

Signs of stress

Indeed, Florida's Space Coast is already beginning to express its collective unease. In late February, more than 1,500 people showed up at a rally in Brevard County to express their opinions. And since December 2009, the Aerospace Workforce Transition Program, which serves all of the communities surrounding Kennedy as well as all of the center's work- and non-work-related services, has received more than 3,000 requests for transition-related services including skills assessment, résumé support, career planning, training and other support services

Inside Kennedy, Bell emphasizes that EAP is there for the workforce. From private, confidential counseling to tailoring help topics for different work groups, they're available to help, coach, train, counsel or just listen — whatever the needs are.

Reese has noticed that people seem more determined to solve the personal problems they bring to Reese and her group. They want stability in the non-work part of their lives.



Space shuttle Discovery lands on Runway 33 at the Shuttle Landing Facility at Kennedy Space Center at 9:08 a.m. on April 20, completing the STS-131 mission. Only three missions remain in the shuttle's manifest.

But the majority of our folks are doing what they always do, which is staying focused.

"Our folks here are not panicking," Reese said. "They're stunned. And I would say that we're all alarmed at what's happened. But the majority of our folks are doing what they always do, which is staying focused. They know how to contain that stuff."

Reese doesn't think that they'll see a whole lot of emotional reaction until they have a full sense of the impact and they've developed their plans. Once those are in place, then they'll relax a little. That's when the emotions will bubble up.

"That's just how our folks are wired," Reese explained. "And it works very well for them with the kind of work they do."

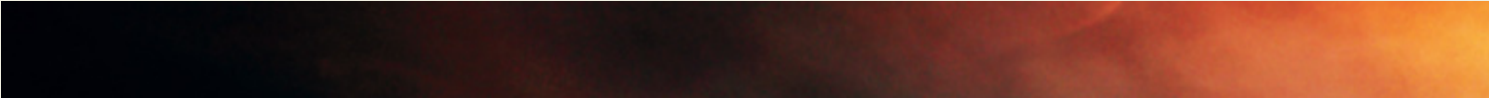
She worries, however, about the health toll compartmentalizing anxiety and stress can have. It takes a lot of mental energy to do that.

So Reese gives her folks gentle reminders about staying healthy in uncertain times without throwing a lot of stress management techniques at them. She calls them the four columns of self care and, basically, they're the commonsense pointers we all know but tend to ignore: Make sure you're getting enough sleep; pay attention to nutrition (healthy food before fun food); exercise regularly; and seek social support in the form of human interaction.

Lastly, she urges folks not to wait until they feel overwhelmed to reach out for help. It's far better to mitigate stress factors early on by resolving them one at a time rather than waiting to deal with them all at once. A single issue can be dealt with in a rational and thorough manner. Stress factors that have been allowed to snowball rarely get fully resolved, because people simply don't know where to begin, what to attack first. The end result is confusion and frustration.

... she urges folks not to wait until they feel overwhelmed to reach out for help.

So in Reese's EAP workshops they learn to recognize and mitigate the impacts of stress, particularly the unique challenges of transition stress, how to improve resiliency and how to develop individual job transition plans. Reese's office also refers workers to the external resources available



to assist them with new job opportunities.

But in the meantime, Reese's EAP office is seeing anxiety levels steadily increase. Reese uses an uncomfortable analogy that everyone understands to describe the current mood within both the workforce and the center's surrounding community.

"It's like someone has their fingertips on the Band-Aid," she said. "We're all waiting to see if they'll pull it off quickly or slowly and what we'll find underneath."

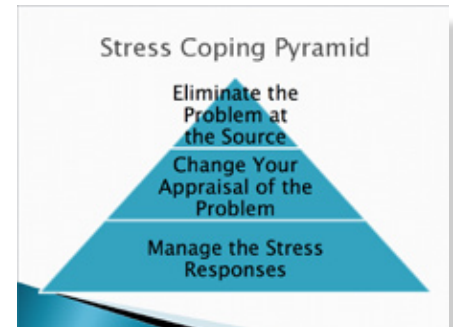
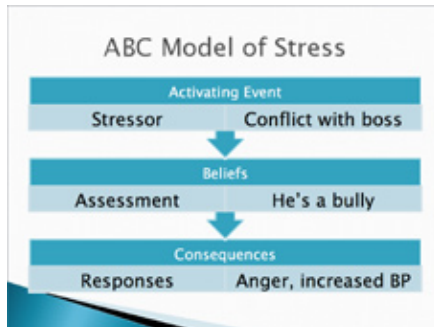
Unwavering focus under pressure

As proactive as they have been in developing tools for stress management and taking them to the workforce, and as prepared as they are to assist and counsel, Bell, Reese and their colleagues know that this is a workforce accustomed to working under a lot of pressure with unwavering focus. A whole lot rides on the job it does on a daily basis – the lives of the astronauts, the success of the missions. And almost everyone feels a fierce responsibility and allegiance to the hardware or system they work on.

That's true for Reese and Bell and the EAP groups at the other centers, too. They are all committed to helping their workforces to the best of their abilities through the challenging months ahead.

Managing Workplace Stress

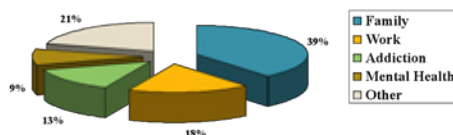
In Managing Workplace Stress, employees are taught to recognize physical symptoms of stress (headaches, sleep disturbances, fatigue, appetite disturbances and digestive problems) as well as psychological symptoms (poor concentration, irritability, apathy, anxiety and depression). Then they learn effective coping strategies such as problem solving, effective communications, cognitive restructuring, good nutrition, relaxation techniques and the use of social support. The module also provides strategies for eliminating problems at the source, and changing the employee's appraisal of the problem while promoting a positive response to stress, such as deep breathing, visualization, relaxation techniques, spiritual connection, good sleep habits and exercise.



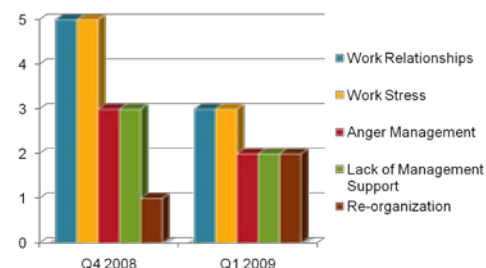
Meeting the Needs of a Workforce in Transition

This module goes straight to the heart of the matter. It acknowledges the key factors that contribute to change and uncertainty, specifically the end of the shuttle program, the future of the space program, reorganization, reductions in force (downsizing), economic conditions and political changes. It also covers the impact of uncertainty on the workforce, and how it's likely to present as stress in family and work relationships, or as financial issues, chronic health problems, depression, anxiety and, in some cases, substance abuse. The module clearly communicates the EAP services that are available to all employees should they need help. These include clinical services for individuals, couples and families, counseling interventions based on client need and extensive referral resources, onsite and off.

Relative Frequency of Problem Occurrence Q1 2009



Most Common Work-related Problems



The Aerospace Workforce Transition Program

The AWTP is a program devised specifically to help aerospace workers on Florida's Space Coast transition smoothly from space shuttle jobs to new employment both inside and outside aerospace. Their mission is to help workers begin early on to make plans for post-shuttle careers by providing skills assessment, résumé support, workshops, educational resources, career planning, training and support services.

<http://www.launchnewcareers.com>